The National Center for Academic Transformation

Experts in improving learning and reducing cost in higher education.

The Learning MarketSpace, January 2004

A quarterly electronic newsletter of the Center for Academic Transformation highlighting ongoing examples of redesigned learning environments using technology and examining issues related to their development and implementation.

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1. THE CAT VIEWPOINT

Perspectives on issues and developments at the nexus of higher education and information technology.

Why Redesign Without A Grant? It's the Right Thing To Do

Regular readers of The Learning MarketSpace know by now that the Center for Academic Transformation is launching a new program,The Roadmap to Redesign (R2R), with partial support from FIPSE, the Fund for the Improvement of Post-Secondary Education. R2R will build on the successes achieved in the Pew-funded Program in Course Redesign (PCR) where 30 institutions redesigned large-enrollment, introductory courses using technology and realized substantial benefits for students, for faculty and for institutions.

R2R is not a grant program. FIPSE funding will be used to develop and provide a wide variety of resources that will support new institutions as they redesign large enrollment courses. Our goal is to simplify the redesign process and make it affordable within existing institutional resources.

In the Pew-funded PCR, the 30 redesigns could be in any discipline as long as the target course was one of the institution's top 25 courses in terms of student enrollment. We asked each institution to invent its own redesign: as long as the redesign met our two-fold goal of improving student learning and reducing instructional costs, the institution could do whatever it wanted. Because we were inventing a new way of offering courses using technology, the planning and implementation period for each redesign was rather extensive: about seven months for planning and about two years for implementation. Because we were determined to gather evidence documenting the results of each redesign, we required each institution to produce detailed assessment plans and a number of detailed progress and outcome reports. To accomplish these rather complex objectives, we gave each institution a $200,000 grant.

The Center's goal is now the widespread adoption of these new redesign methods throughout the broader higher education community. While the development process used in the PCR was extremely successful, it would be too costly for large numbers of institutions to replicate that process in the next phase of development. A considerable amount of time and money in planning and in implementation was spent. The challenge now is to accelerate institutional adoption by simplifying or streamlining the redesign process.

In R2R, the Center will support 20 institutions as they redesign large-enrollment, introductory courses in a limited number of disciplines—precalculus mathematics, psychology, Spanish and statistics—in order to test a new model. The new model will partner experienced, successful institutions with new institutions and take advantage of best practices, virtual repositories of research-based learning materials with a proven track record, and a streamlined redesign methodology. In essence, we will guarantee that if new institutions follow our advice—derived from the successes achieved in the PCR—they will improve student learning, increase retention and reduce instructional costs.

Although the R2R program will not offer grants to participating institutions, a tremendous amount of support will be available from the Center. Teams including faculty and other personnel from successful PCR institutions will work with new institutions as they make choices among the materials and proven models for their own redesigns. In addition, the Center's experienced staff will provide individualized consultation and support, helping new institutions apply the streamlined redesign approaches in planning, implementation and assessment. As a result, the planning period will be reduced to about two months and the implementation period to about 15 months.

Part of the Pew-supported grant money was dedicated to an extensive data-gathering and reporting process, which will not be required in R2R. For example, we will ask each institution to develop an assessment plan based on choosing among proven models and to complete a brief final report that summarizes results. The Center will also support institutional participation in three program workshops, whereas the Pew-funded projects paid their own expenses to attend program workshops from their grants.

The bottom line question for many is, can a redesign be done without a grant? We say yes. We believe that it is possible because we can now provide R2R institutions with many more resources than were available in the Pew-funded PCR. We now have successful models and materials as well as a process that has resolved many of the important planning, implementation and assessment issues. Some additional internal institutional support may be necessary, depending on the redesign model chosen and the level of available campus resources. Because institutions can now calculate with confidence the potential savings to be accrued from the redesign, they may want to "borrow" against those savings to support any aspects that cannot be supported with existing resources.

The most important point is, of course, that R2R will help institutions address some of their most pressing problems, including:

- Improving student learning in critical first-year courses;
- Reducing drop-failure-withdrawal rates and increasing student retention;
- Discovering how to offer courses more cost effectively;
- Serving more students with the same instructional resources;
- Resolving higher education's historic trade-off between cost and quality; and,
- Generating a return on their information technology investments.

While you won't receive a grant if you participate in R2R, you will become skilled at a redesign methodology that can be replicated in other courses and other disciplines throughout your institution. And you will join a highly visible national effort that puts your institution on record as one that is pointing the way to address the significant academic and fiscal problems that face all higher education institutions.

It's the right thing to do.

--Carol A. Twigg

2. THE ROADMAP TO REDESIGN (R2R)

R2R Application Guidelines Now Available

Application guidelines for institutions interested in joining the Roadmap to Redesign (R2R) are now available on the Center for Academic Transformation's web site at The Roadmap to Redesign.

Follow the "Information for Applicants" link to view the guidelines, FAQs about R2R, a set of readiness criteria that will be used to pre-qualify prospective applicants, and a full program description.

Applications are due on April 1, 2004.

Corporate Associates Invited to Join the R2R Initiative

The Center for Academic Transformation is pleased to announce a Corporate Associates Program as part of R2R. Corporate Associates will have the opportunity to gain direct access to information about how and why both new and traditional learning materials are being used through interactions with Center staff, core institutions and new institutions. They will be able to take advantage of opportunities to expose their products and services to these audiences and to involve these audiences in evaluating their products and services.

Possibilities for interaction with R2R include establishing one-on-one contact with participants, convening focus groups or other topical meetings, participating in academic practice meetings and workshops; visiting core and new associate institutions' redesign projects and distributing questionnaires about issues of particular interest.

Thomson Learning has already committed to being part of this cutting edge endeavor. The Center looks forward to working with Thomson and other associates in the future. For more information about the Corporate Associates Program, contact Carol Twigg.

3. UPDATES FROM THE PROGRAM IN COURSE REDESIGN

Featuring progress reports and outcomes achieved by the Program in Course Redesign.

Center Workshops Help Launch Campus Redesigns

As part of our commitment to helping others who would like to replicate the PCR in their home institutions, the Center has recently conducted two workshops to introduce faculty, administrators and staff to the redesign process. Georgia State University is conducting its own redesign program and has received proposals to redesign three large enrollment courses. The Center offered an on-campus workshop for faculty currently involved in redesign as well as those who are considering future redesigns, and for administrators and technology staff. The University of North Carolina System is undertaking a planning process to support its 16 campuses in redesigning large enrollment courses. The Center offered a workshop attended by 12 of the 16 campuses to kick off the new initiative. The System also expects to sponsor a second workshop in May once the redesign teams have been finalized on participating campuses. For more information about the Center's redesign consulting services, see NCAT Staff and Board of Directors.

Interest in State Based Initiatives Increases

In the face of growing economic pressures and a desire to improve the quality of undergraduate education, several states or state systems are exploring with the Center the development of state-based programs in course redesign modeled on the national Program in Course Redesign. These programs will involve a competition within the state to select institutional redesign teams with the joint goal of increasing student learning and reducing the cost of instruction in large-enrollment, introductory courses. Program sponsors, who would need to fund the initiative, may include state legislatures, state system offices or public/independent coalitions. This idea is especially attractive to states that find it difficult to meet enrollment demands without finding innovative ways to so. Among the states having conversations with the Center are California, Hawaii, Ohio and Oklahoma. For more information about the State-based Redesign Initiative, contact Carol Twigg.

Redesign Projects Updates

Carnegie Mellon University has successfully completed the reorganization of Introduction to Statistical Reasoning and continues to build on the redesign principles. The two-term course has been combined into a one-term course by adding one lecture per week and expanding the amount of content StatTutor (formerly SmartLab) covers. The scaffolding structure of StatTutor that increased student learning in the original redesign continues to support students' ability to master more content more effectively.

Fall 2003 was the first semester of the completely redesigned introductory biology curriculum that built on the original redesign of one biology course at Fairfield University. Faculty have adopted an introductory textbook that is in line with their inquiry-based objectives, and students are learning to ask questions rather than memorize facts. Students use laptops every third meeting in most labs. Faculty maintain a commitment to lowering lab costs by using digital resources such as BioQUEST's Genetics Construction Kit, which allows students to mate virtual fruit flies to learn about Mendelian genetics. This activity would be impossible without the technology since fruit flies take four weeks to mature and mate and the material is expensive, among other reasons. Students now complete the virtual activity in one lab period. The redesigned curriculum has also opened opportunities for faculty to teach more upper-level courses.

The redesigned Understanding Visual and Performing Arts course at Florida Gulf Coast University (FGCU) has been fully implemented, and several new faculty members have been trained to rotate into teaching the course. After two years of design and continued refinement, the course is running very smoothly with higher retention and success rates and higher grades. The alternative staffing model and the use of the Intelligent Essay Assessor to grade short essays continue to be two of the primary innovations that have led to a reduction in cost. In fall 2003, 650 students registered for the course; in spring 2004, FGCU anticipates an enrollment of 800 students. The university plans to experiment with setting up a special cohort of students who are also registered in FGCU's learning community, hoping to achieve an even higher level of student success and retention in the course. FGCU continues to experiment with redesigning other courses, especially math and science courses that use the alternative staffing model. FGCU also plans to experiment with using the Intelligent Essay Assessor in several other courses.

The State University of New York at Buffalo (UB) continues to see excellent results from their redesign of its Computer Literacy course for non-majors. Like most institutions, UB has observed that students arrive on campus more computer literate than was true several years ago. Consequently, UB has begun a review of the course content to keep up with more sophisticated new students. A key part of the UB redesign was the introduction of undergraduate teaching assistants (UGTAs) in place of graduate teaching assistants (GTAs), which has continued. The UGTAs relate much more closely to campus culture and to what students are facing in the course. In the original redesign, GTAs were retained primarily for grading. With the advent of more computerized grading, the faculty members have less concern about the need for GTAs to accomplish this task.

UGTAs are also now part of the introductory computer science course for majors with the same excellent results.

As the redesign of English Composition matures, Tallahassee Community College has funded various faculty development activities to ensure full institutionalization of the redesign. During the 2003-04 academic year, the initial redesign team was re-assigned to do the following: one faculty member mentored all adjunct faculty, another conducted needs assessment interviews with full- and part-time instructors, another oversaw the revision of the common assignments, and another trained and mentored all instructors regarding the technological components. In fall 2003, all full-time course instructors were given a one-semester reduction in class size, from 30 to 25 students, to allow for focused learning of the new technological and curricular aspects of the redesigned course. Each instructor kept a learning and process journal and submitted an end-of-term synthesis.

In addition, funding has been provided to expand use of the tutoring service, SMARTHINKING, for selected sections of the course. Follow up surveys have been distributed and data collected to document efficacy of the expenditure. Also, Turnitin, a plagiarism detection service, has become part of the course to assure autonomous freshman essay writing since the menu of common course assignments could give rise to student cheating from section to section or term to term.

Redesign is spreading at the University of Alabama. Introduction to Deductive Logic has been redesigned to use information technology in a more self-paced approach. Students read online and work practice problems using interactive software freely available on the Internet. Lectures have been eliminated; instead, the instructor and teaching assistants work individually with each student as needed. When students feel they have a sufficient grasp of the material, they take a test. The course is modularized into four units, and students cannot move on to a new unit until they have demonstrated mastery of the previous one. Because the tests are computer-generated and computer-administered, students can attempt to demonstrate mastery as many times as needed.

Faculty members are very satisfied with the learning outcomes in this new version of the logic course. In the past, it was not unusual for as many as 25 to 33 percent of the students to fail. In the first offering of the redesigned course, no student earned an F, and in the most recent offering, only two students earned F's. Grades in this course are also more meaningful than they were in the past, as they now reflect how much logic a student has mastered rather than how much partial credit he or she has been able to accumulate over a semester. In addition, the students are happy with the course. In fall 2003, students in the redesigned course took a pretest and a posttest covering formal reasoning skills and showed significantly better learning. Ordinarily, training in formal logic does not produce improvement on these tests.

At the University of Iowa, success in the redesigned General Chemistry continues. The outcomes reported in the final report have been sustained and are independent of any particular instructor. Faculty members are now dealing with the success of the redesigned course. More students are studying chemistry! The traditional course had fall enrollments of 664, 644, and 647 in 1999, 2000, and 2001 respectively. In the redesigned course, enrollment jumped to 816 in fall 2002 and 984 in fall 2003 with rather constant enrollment in the entering classes--a result of good pedagogy and good advertising.

To learn more about the original redesign projects conducted by these institutions, go to Program in Course Redesign and follow the links.

4. CUTTING ACROSS

Highlighting themes and activities that cut across redesign projects.

Alternative Staffing Is Both Effective and Efficient

An analysis of the thirty projects in the Program in Course Redesign has shown that all of them share six characteristics, one of which is the use of alternative staffing models. By constructing support systems consisting of various kinds of instructional personnel, the projects apply the right level of human intervention to particular student problems. Not all tasks associated with a course require highly trained, expert faculty. By replacing expensive labor (faculty and graduate students) with relatively inexpensive labor (undergraduate peer mentors and course assistants) where appropriate, the projects increase the person-hours devoted to the course and free faculty to concentrate on academic rather than logistical tasks.

Using alternative staffing models also allows institutions that do not have graduate teaching assistants to find creative ways to reduce the cost of instruction while increasing the level of student support. What follows are some examples of some of these alternative staffing models.

In its redesign of four mathematics courses, Rio Salado College uses a course assistant to address non-math-related questions, which characterizes 90 percent of all interactions with students; to monitor students' progress; and to follow up with those who fall behind. This frees the instructor to concentrate on academic rather than logistical interactions with students. Students get quick responses to their questions as well as accurate, consistent information. As a result, Rio can substantially increase the number of students taught by each instructor.

Undergraduate teaching assistants or peer mentors have played an important role in several redesign projects. At the University of Colorado at Boulder, undergraduates monitor small learning teams, work with students as they collectively prepare responses to a series of weekly questions in Introductory Astronomy, and provide

feedback to the lead faculty member about how well the teams are working and where students are having difficulty with the material. The undergraduate peer mentors are trained in small-group facilitation and in principles involved in teaching introductory science courses. As a result, UC has seen increased interest in careers in teaching science among the peer mentors.

At the University at Buffalo, undergraduate teaching assistants (UGTAs) have been extremely successful in working with students in the computer literacy course for non-majors. Because they are familiar with the campus culture and have some expertise in the content, they are able to help students more effectively. UB is expanding the use of UGTAs to other courses. UGTAs are also key for the three institutions that use the emporium model in their redesigns: the University of Alabama, the University of Idaho and Virginia Tech. Here UGTAs join graduate teaching assistants and faculty in working with math students in the multiple courses that occur simultaneously in the math lab.

Florida Gulf Coast University (FGCU) has created a new position they call the preceptor. Preceptors, who are senior undergraduates or recent B.A. graduates, have been quite effective at monitoring and managing the online group discussions that are part of the redesigned Fine Arts course. Because FGCU is experiencing significant and continuing growth, the ability to scale the course is made possible by the inclusion of preceptors who work under the supervision of lead faculty members. As enrollment increases, FGCU is able to recruit and train preceptors rather than hiring more adjunct faculty while maintaining important faculty oversight via ongoing curricular review and course coordination.

Just as a redesign project planning process benefits from a team approach involving personnel who have a variety of skills and abilities, so too does the redesign implementation benefit from a similar approach. By including alternative staffing, institutions are able to provide more support for students when they need it and to do so at a reduced cost. Alternative staffing also allows the redesign to scale effectively since increased enrollment does not require more faculty hiring.

Details about the findings from each of these projects can be found by following the links at Program in Course Redesign.

5. COMMON GROUND

Reporting on initiatives that share the Center's goals and objectives.

Increasing Interaction in Large-Enrollment Science Courses

At Harvard University, Eric Mazur has developed a number of innovative methods for teaching large lecture classes in undergraduate science interactively and has bundled them in an Interactive Learning Toolkit that supports their implementation. Strategies to streamline the organizational work that is part of teaching a large science course include pre-tests to prepare students for class, interactive class exercises using personal response systems such as ClassTalk, and short concept quizzes to assess student learning and serve as a basis for small group discussion. Faculty users can select materials for class use from a large class-tested database and organize (and possibly share) their own materials. With the Interactive Learning Toolkit, faculty can also administer their courses, design course Web pages, and interact with students online. To participate in the beta testing program, contact Mazur at galileo@deas.harvard.edu with the subject "ILT Beta Testing Project". To learn more, see http://galileo.harvard.edu/index.html.

President Challenges South Missouri State University to Replicate National Outcomes

In his State of the University Address on January 8, 2004, President John Keiser challenged the faculty and staff at South Missouri State University (SMSU) to focus on effective teaching using technology, the scholarship of academic development and learner-centered instruction and to use integrated approaches to designing college courses in order to "achieve the same types of results documented in the Program in Course Redesign." At SMSU, the top 25 courses account for almost 67,000 credit hours or 31 percent of its total credit-hour production. Dr. Keiser asked top administrators and faculty to "analyze these courses and make the design and delivery changes necessary to achieve the same level of results that have been accomplished nationally." To read President Keiser's entire State of the University Address, see http://www.missouristate.edu/president/keiser/speeches/statead22/text.asp.

6. CALENDAR OF EVENTS

APRIL

- R2R application deadline
  April 1
- Publication of The Learning MarketSpace
- 40 institutional teams invited to R2R workshop
  April 15

JUNE

- R2R Workshop for 40 institutional teams

JULY

- Publication of The Learning MarketSpace

AUGUST

- Full R2R proposal deadline for 40 finalists
  August 1
- 20 new institutions selected to participate in R2R
  August 15

SEPTEMBER

- 20 new R2R redesign projects begin

7. SUBSCRIPTIONS, SUBMISSIONS, ARCHIVES, REPOSTING

The Center for Academic Transformation serves as a source of expertise and support for those in higher education who wish to take advantage of the capabilities of information technology to transform their academic practices.

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